

# Report on 2022 season of the fieldwork project at the site of Mycenaean Pefkakia

Bartłomiej Lis, Anthi Batziou, Jakub Niebieszczanski, Tomasz Herbich, Robert Ryndziewicz

## Introduction

The five-year (2022-2026) archaeological project at the site of Mycenaean Pefkakia is a collaboration between the PAIA and the Ephorate of Antiquities of Magnesia, co-directed by Anthi Batziou (Ephorate of Antiquities of Magnesia) and Bartłomiej Lis (Polish Academy of Sciences), with the assistance of Dimitris Agnoustiotis (Ephorate of Antiquities of Magnesia). Fieldwork at the site in 2022 focused on non-invasive investigations prior to the four excavation seasons planned from 2023 to 2026. The work was divided into two parts: geophysical survey and geoarchaeological coring.

Between July 4 and July 23, 2022, geophysical survey was conducted by a team from the Institute of Archaeology and Ethnology covering an area of ca. 6 hectares (ha). The survey was carried out by Tomasz Herbich and Robert Ryndziewicz, who were assisted by Zbigniew Narkiewicz and four students from AMU (Patrycja Białkowska, Mikołaj Kasprzak, Piotr Zeman and Oliwia Walczak).

Following the geophysical survey, and upon consideration of its preliminary results, 20 geoarchaeological cores were obtained by a team from AMU, led by Jakub Niebieszczanski, assisted by Cezary Bahyrycz, Piotr Majorek and Sebastian Teska. The drillings were conducted between September 15 and 27, 2022.

The main area under investigation is located south of a modern road running approximately E-W, with the site of Magoula located to the N (Fig. 1). The southern edge of this area is defined by a sharp rise of the terrain in the SE part, and the site of the sanctuary of the Mother of the Gods to the SW, where excavations carried out by A. Batziou revealed a Hellenistic cult area with Mycenaean levels below (Batziou forthcoming). Within this broad area measuring ca. 10 ha in size, to the NE there is also a site of recent systematic excavations that revealed extensive Mycenaean remains (Batziou, Efstathiou 2015) under a thick layer of Hellenistic accumulation that was, however, associated with little architecture. Over the last 5 years, this



Fig. 1. Plan of the area under investigation, with marked areas surveyed by geophysical survey (yellow polygons), locations of vibra-cores (red dots), and main areas excavated to date (red rectangles).

area was under a joint excavation by the Ephorate of Antiquities of Magnesia and the University of Thessaly. In addition, a small area close to the store rooms and laboratory of the Ephorate (No. 8 on Fig. 1) was also investigated in the current study.

### Geophysical survey

The major challenge of investigating the Late Bronze Age (Mycenaean) remains is the substantial human activity in Hellenistic and later periods. Hellenistic habitation is related to the establishment of Demetrias, the capital of the Macedonian king, Demetrius I Poliorcetes, in that area in 293 BC. The center of the city with the palace of Demetrius is located at a short distance to the SW from the area under investigation. Previous geophysical work has been conducted in the core area close to the palace in Demetrias (Donati et al. 2017, fig. 9), and revealed a very clear layout of part of the Hellenistic city.

Under these circumstances, the two main aims of the current geophysical survey were to a) characterize the layout and density of architectural remains of the Hellenistic city that were expected close to the modern surface, and b) map the remains located beneath the Hellenistic layers, which according to the information deriving from excavations, should be located starting at a depth of 1 to 1.5 m.

To that end, the preferred method was Ground Penetrating Radar (GPR)<sup>1</sup> due to its depth of penetration and the ability to distinguish the depths of measured anomalies. Investigations with GPR revealed a clear layout of Hellenistic Demetrias, with a regular street network defining rectangular insulae with dimensions of ca. 50 x 107 m. Outlines of four streets running N-S are marked by their side walls and two streets with perpendicular E-W orientation are clearly visible on a time-slice representing a depth of ca. 65 cm (Fig. 2). In many places, outlines of the side walls can be identified at deeper levels, attesting to walls of substantial depth. Many of the insulae show dense concentrations of residential and probably also other structures. In terms of the density of architectural

<sup>1</sup> A Mala GX system equipped with a 450 MHz HDR shielded antenna was in use to obtain optimum compromise between depth of prospection and resolution. The measurements were carried out along parallel profiles 0.5 m apart with a 0.025 m sampling density 0.025 m. Recorded data were processed using Wave 1.8 by Gpr. Software and transformed into time-slices to visualize a horizontal distribution of the summarised electromagnetic reflectivity at particular depth levels.

remains within the insulae, areas located in the N part of the investigated area (i.e., directly S of the modern road) show very few walls that follow the regular plan of a Hellenistic city. These are the lowest-lying areas of the site and, at least in the SE part, are located close to the Hellenistic city wall that encircles the entire city of Demetrias. This part of the wall was revealed during small rescue excavations conducted in 1987 by A. Batziou, and the NE edge of the area was identified in this study with GPR. Some blocks that most likely belong to this wall are still visible on the surface.

Apart from structures that can be associated with Hellenistic activity, several structures represented by anomalies in the GPR survey are located close to the current ground level and display a different orientation. Moreover, a structure comprised of several rectangular rooms in the S-most part of Area 2 is clearly laid out above one of the streets of Hellenistic Demetrias. Such structures are clearly post-Hellenistic in date and perhaps relate to the Roman phase of activity at the site, attested at a number of nearby excavations including those at the site of the Tavern.

Earlier pre-Hellenistic structures at the site were revealed by GPR only to a limited extent, showing that the method has limited penetration in local soil conditions at Pefkakia. Single linear anomalies are most frequent, and rarely comprise clearer structures that can be identified as buildings. One of the exceptions is a narrow rectangular structure, possibly with internal divisions, detected at a depth exceeding 2 m in the S part of Area 5 (Fig. 1), beneath the possible post-Hellenistic structure mentioned above. Interesting circular anomalies that extend to a considerable depth of ca. 2 m were revealed in the N part of Area 1, where there was little or no evidence for Hellenistic structures in the upper levels apart from the walls that defined the insula.

Two additional methods - magnetometry<sup>2</sup> and electrical resistivity<sup>3</sup> – were applied in a complementary fashion and with different research questions in mind.

Magnetic survey revealed the same regular street

<sup>2</sup> A FM256 gradiometer by Geoscan Research was used at the site. Magnetic measurements were carried out with a resolution of 0.1nT. Sampling density was 8 measurements per m<sup>2</sup> (0.5 x 0.25m) The data was processed in Geoplot 4.0 software.

<sup>3</sup> The twin-probe array was used for resistivity measurements, with traversing probes set 2 m apart. The survey recorded changes of apparent resistivity to a depth of approximately 3 m.

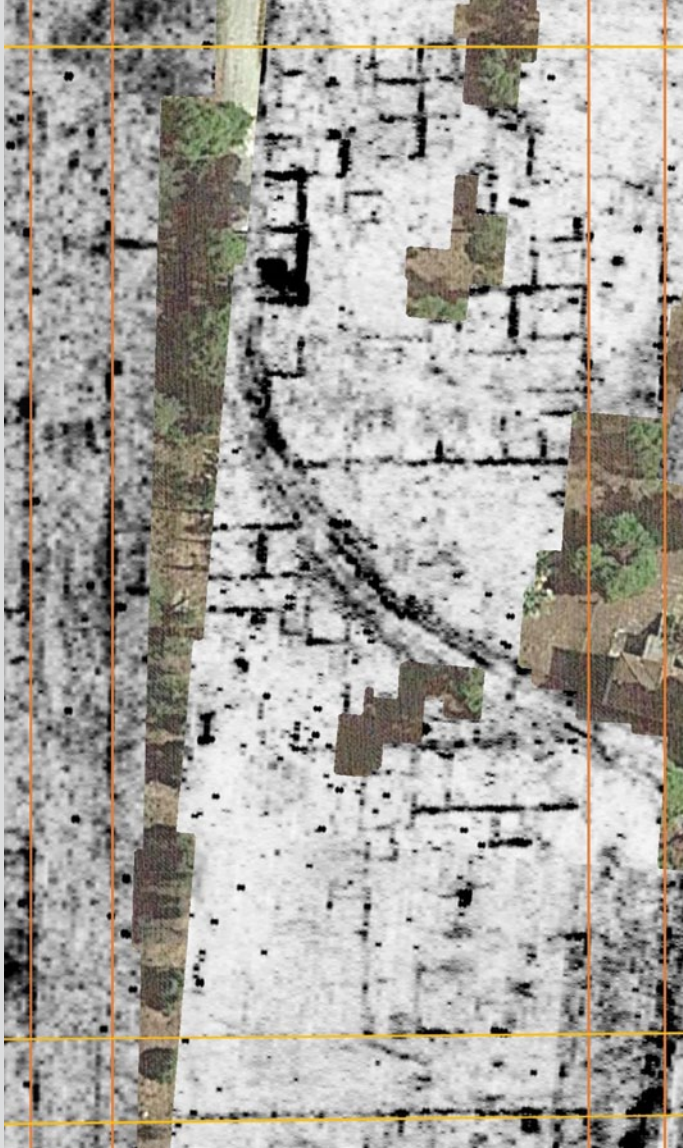


Fig. 2. Results of geophysical prospection with GPR. Time-slice at a depth of 65 cm from areas 5 and 2 showing a single insula with four streets.

grid in much of the covered area, however with little evidence for structures within the insulae. Importantly, at least two circular anomalies could be identified as possible kilns, due to their distinct characteristics.

Electrical resistivity survey conducted in the N part of Area 2 (Fig. 1) revealed a zone of higher resistivity that could correspond to a bedrock outcrop with its top located close to the surface, surrounded by deposits of distinctly low resistivity.

### Geoarchaeological coring

Geoarchaeological coring at the site of Mycenaean Pefkakia was conducted to a) verify the stratigraphy of the site following the results of the geophysical survey, and b) obtain data for palaeogeographical reconstruction of the landscape during the Late Bronze Age.

Most of the cores from the investigated area were obtained using conventional augering equipment operated by hand. These were mostly related to the site area, where compacted and artifact-rich sediments were encountered. The vibra-coring method

was used when the occurrence of soft sediments of marine or marshy environments was anticipated. In total, 20 locations in Pefkakia were drilled, comprising of 5 vibracores (PEF\_01-04 and PEF\_07, marked with red dots on Fig. 1) and 15 conventional ones.

The stratigraphical coring of the site was guided by the position of anomalies identified via magnetometry and electrical resistivity that suggested the presence of pre-Hellenistic features. In all the cores, the topmost layer contained Hellenistic artifacts, mostly tiles and pottery fragments with numerous charcoal fragments throughout the sampled material. At some locations (i.e., PEF\_08, PEF\_12, PEF\_15 and PEF\_20), cultural layers belonging to the Late Bronze and perhaps the Middle Bronze Ages were registered based on associated small pieces of pottery beneath the Hellenistic deposits. The depth at which such layers were recorded varied from ca. 1.0 to 2.0 m. The last stratigraphical unit at each coring location was marked by bedrock consisting either of greenish chloritic schists or whitish weathered marbles.

To reconstruct the past local landscape, and in particular to verify earlier research on the marine transgression (Kambouroglou 1994) in the area and to obtain higher resolution of its maximal reach, five cores were obtained using the vibracoring method along a W-E transect (PEF\_01; PEF\_02; PEF\_03; PEF\_04 and PEF\_07, Fig. 1). The first stratigraphical observations of the five vibracore profiles as well as two hand-drilled ones (PEF\_08 and PEF\_20) suggest that the sea penetrated much further inland both with respect to the current situation and as reconstructed by Kambouroglou (1994, Figs. 10-11). Moreover, based on cores from locations PEF\_07, 08 and 20, it is very likely that at some point, a narrow stretch of sea water separated Magoula from the mainland. This episode is reflected by the presence of bluish-grey muds abundant in mollusks shells. Within the sediments, numerous charcoal fragments and pottery sherds, including examples dating to the Late Bronze Age, indicate that the transgression was accompanied by human activity. A marshy environment must have followed, which corresponds with the data of earlier geomorphological investigations. Preliminary interpretation based on the morphological and topographical observations suggests that the sea recessed from this area due to tectonic uplift, as there are no water courses that might have silted up the shallow intrusion of the sea. Above the marine and marshy units, a layer most likely dating to the Hellenistic period was encountered that was

abundant in pottery fragments and tiles, thus marking the terrestrial character of the environment at that time.

Further analyses of the obtained cores include

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